

and expense to the companies ever since, and the residents still complain of the great annoyance from the smell of gas that prevails; this would not have been the case had the mains been laid in the places previously named. Immediate steps ought to be taken to remedy and prevent the occurrence of the immense waste that is daily taking place, and which will prevent the price of gas from being reduced. I stated this loss to be about 35 per cent., and I have since seen it stated by a gentleman connected with the Chartered Gas Company, as being from 30 to 40 per cent., and I think this ought of itself to be sufficient to induce the companies to take efficient means to remedy the evil, as it renders them incompetent to compete with or withstand the opposition of a new company. They may flatter themselves by placing their losses to other causes, but may rest assured their principal loss arises from leakage underground; it is extraordinary to think how little attention has been paid to this essential part of gas lighting. The main and service-pipes are to the works what the arteries and veins are to the human body, and ought not to have been so long neglected. Trusting that the companies will be wise in time.

I am, Sir, &c.,
March 7th, 1846. CARBON.

CURVES FOR ARCHITECTURE.

"Judgment also I will lay to the line."

I was not a little pleased, although much surprised, to see your report of Professor Cockerell's lectures in the same number in which my paper appeared. "On the necessity of a more extensive knowledge of true lines," and to observe, that he had alluded to the "hyperbolic line" and "conic sections."

As you state it was his last lecture for the season, we cannot expect any more on geometrical curves from that quarter at present, but let us hope that before another season, he will devote his valuable attention to this as a practical subject.

Also, in your report of the meeting on the 23rd ult., at the Royal Institute of Architects, the word "hyperbolic" likewise appears.

Although so little, on these two occasions, has been said, yet they are sanctions to the very great importance of the inquiry, which gives encouragement.

It would be desirable, and I trust you will be enabled to give to your readers the measurements, a description of the mode of measurement used, and the proof that the curve of the shaft of the columns of the Parthenon is "hyperbolic, and no other;" not, for example, a conchoid, or any other asymptotic line.

Perhaps Mr. Penrose will be so obliging as to furnish you with a description of the probable practical method by which the ancient Greek architects or workmen described the line full size with so much accuracy.

It would be interesting to know what ocular and practical knowledge of true geometrical curves Mr. Penrose had before visiting Greece, especially as compared with those who had preceded him there; and whether it was upon such circumstances that he was enabled to determine what is stated, and what no other had before accomplished.

Would it not be equally interesting to know the nature of the curve, and the means the ancient Egyptians used to describe practically the profiles of any of their columns?

"Four centred arches" is, I suppose, a modern term, and the sooner it is blotted out of architectural works the better, as there is no necessity for drawing depressed arches on any such false principles; as false as that of patching together four parts of circles, and calling the figures, or substituting it for, an ellipse. Perfect examples, on a perfect plane, on as large a scale as convenient, ought to convince the most sceptical of their imperfect notions. But when will architects make themselves acquainted with true geometrical forms, and the methods by which workmen may describe them in practice accurately?

Architects admit that the Greeks were superior in this knowledge. Why, then, do they not practice or recommend the cultivation of this science, that even the Greeks may be surpassed? Architectural knowledge in the present day appears to consist more of fine terms, than of true forms and real practical information for their true construction.

Supposing Mr. Penrose can satisfactorily prove what he states, does it not shew the very great importance of the mind being familiar with the actual appearance of extreme and intermediate varieties of the hyperbolic lines? What work on "conic sections" can be pointed out that would furnish the eye with a form which would suggest such an application of the hyperbola as to the profile of the shaft of the column of the Parthenon? Before the Greeks could have applied either the hyperbola or any other geometrical lines they must have known them. Other geometrical curves, in like manner, must be known before they can be applied.

There is no more than just importance given to the consideration of this one "hyperbolic line" and to this one application of an hyperbolic line, and in this I agree with Mr. Tite; but equal importance should be attached to hundreds of other geometrical lines, as a knowledge of them would lead to thousands of at present, unknown applications and rules for applications.

It would be impossible to find time at present to pen all the thoughts that have passed through my mind on reading, and since reading, your reports just alluded to, or on my increasing conviction that every exertion should be made by those who have influence and judgment to assist and direct, to have this subject as fully, and in as perfect a manner as possible, brought before the public as the elements of all true design and construction. Nature should be well and constantly studied, and that will furnish numerous suggestions as to application, and produce the greatest scope for variety in designs, but geometry must furnish the true rule, and prove the truth of the law of application.

The mathematical instrument maker, the correct hand and eye of the draughtsman, and the engraver, the printer, &c., &c., must be employed on terms that will enable them to produce a work of the utmost degree of perfection; but all know, that if the numbers who would be benefitted could be made to feel interested in such a work, and would unite, that the individual cost would be trifling compared with the great importance of the subject.

5th March, 1846. JOS. JOPLING.

GRADIENTS FOR LOCOMOTIVES AND ATMOSPHERIC LINES.

SIR,—For the information of your correspondent, on the subject of gradients, I beg to state that the steepest gradients that have been successfully worked upon railways with which I am acquainted, are on the Lichey incline of the Birmingham and Gloucester Railway, which has a rise of 1 in 37, and is worked with an assistant locomotive engine, and one on the Edinburgh and Glasgow, with a rise of 1 in 42.

On the Kingstown and Dalkey Atmospheric Railway, Ireland, the gradient is 1 in 115, but gradients even up to 1 in 20 may be readily surmounted by increasing in due proportion the diameter of the tube, and the power of the machinery; this is not desirable, because it entails a heavy expenditure. Like the locomotive system, the atmospheric is better adapted for planes that approximate nearer to the horizontal, in its maximum effect and economy of working, but it is capable of ascending inclinations that cannot be surmounted with a locomotive engine. Inclines on the locomotive system exceeding 1 in 50, ought to be worked by stationary engine power. The gradients on many of the projected railways in South Wales are of a severe character; in consequence of the mountainous nature of the country; on the South Wales Railway, the steepest gradient is 1 in 52, the Aberdeen Railway 1 in 66, the Brecon and Merthyr Tydfil 1 in 62, the Welch Midland 1 in 37, the Great Eastern and Western 1 in 44, and the Vale of Neath 1 in 30. These inclinations are of no great extent, and it is intended to work them with locomotive power. The steepest gradient on the proposed Hereford and Merthyr Tydfil Railway is 1 in 21, and this line is intended to be worked with atmospheric power. Many of the proposed Welsh lines of railway have been withdrawn or abandoned, some in consequence of not receiving that countenance and support that was anticipated; others from grievous errors in the plans and sections; the

latter circumstance does not reflect much credit on the eminent engineers who lent their names to these projects.—I am, Sir, &c.,
Merthyr Tydfil, March 3rd, 1846. B. B.

OLD AND MODERN GOTHIC ARCHES.

SIR,—Can you or any of your intelligent correspondents inform me how it is, that one never sees an ancient "pointed" building, whose arches have a keystone, and rarely, if ever, sees a modern one whose arches are without a keystone. It cannot be alleged that this is a pedantic objection, for in practice the two modes operate very differently on the cost of a building. I have seen keystones in modern arches formed at great expense, where in like situations an ancient arch would have a mere joint, and some of these have stood unmoved for 500 years.

Your old subscriber,
London, March 2, 1846. W. Y.

*• The use of a keystone in pointed arches is erroneous, although, as W. Y. justly says, it is to be found in most of the modern Gothic buildings.

Correspondence.

SMALL DRAINS.

SIR,—Your notice about drains, in the last number of THE BUILDER, deserves much attention; any hint from practical men would be exceedingly valuable. In the meantime, I would suggest that the pipes for London service should be somewhat larger, and at the extreme end, where they would join the main sewer, if a slight dip is formed, it would become a stretch-trap, by the last drop of water remaining in the bend, and effectually prevent any effluvia from returning to the house from the main sewer. A bend of this kind in so small a pipe could not possibly retard the flushing.—I am, Sir, &c.,
March 9, 1846. Z. Z.

Miscellaneous.

PARLIAMENTARY REPORT ON ART-UNIONS.

—The Committee of the House of Commons, appointed so long back as May, 1844, have at length published their Report. It forms a ponderous tome of 527 pages, and includes the evidence of Messrs. Godwin, Cash, G. M. Mason, Bell, Stewart, Blacker, Fabry, T. Uwins, R.A.; A. Cooper, R.A.; W. Wynon, R.A.; W. Etty, R.A.; Copley Fielding, C. Stanfield, R.A.; Wagstaff, H. Graves, Leggett, Ryall, John Burnet, John Pye, D. Colnaghi, W. Finden, Turner, V. Palmer, McQueen, Shenton, Moore, Boys, C. L. Eastlake, R.A.; Mrs. Parkes, Brett, Vokins, and G. Foggo, in the order we have placed them. The Appendix contains the prospectuses of various foreign art-unions. We shall look to the Report anon.

THE MIDDLESEX NEW PRISON.—We stated last week that the designs for the Middlesex House of Detention were furnished by the government inspectors of prisons; and this has been generally reported. The fact is, however, that it is from an original design of the county surveyor, Mr. Moseley, the magistrates having determined to adopt that gentleman's plan for the entire rebuilding, rather than that of the "Surveyor General of Prisons," for its partial construction only; and the Secretary of State having (subsequently upon the report of the inspectors) sanctioned this more perfect mode of execution. The work is proceeding under the superintendence of Mr. Moseley.

THE THAMES TUNNEL.—At a meeting of the proprietors of this undertaking, held last week, a report from the court of directors was read. From it we learn, with regret, that Sir Isambard Brunel is so seriously indisposed, that he is not likely again to take any active share in the concerns of the company. None of the schemes for carrying a railway through the tunnel are sufficiently matured to warrant a detailed reference to them.

GREEN-HOUSES, &c., UNDER BUILDINGS ACT.—Weeks and Day, of the King's-road, Chelsea, have prepared a petition to Parliament, praying that these and such like buildings be exempted from the control of the Act, and they ask the co-operation of parties interested.